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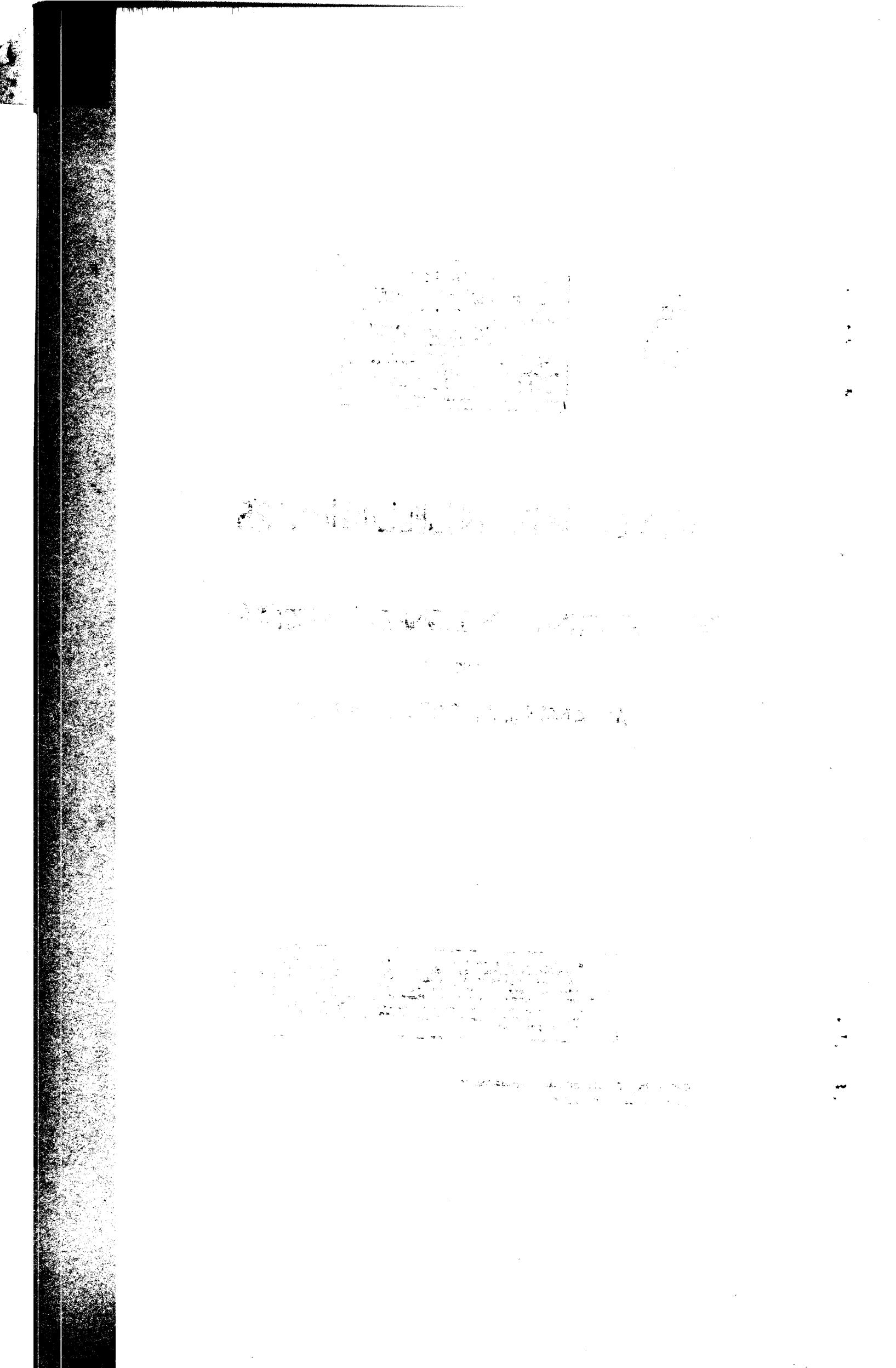
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CHIEF INSPECTOR OF ARMAMENTS,
WOOLWICH, S.E.10.



SECURITY.

Ammunition Bulletin N.25
for
Inspecting Ordnance Officers
and
A.A. Ammunition Officers.

ISSUED BY :-

CHIEF INSPECTOR OF ARMAMENTS,

WOOLVICH.

January, 1942.

Contents.

411. Shell pointed or piercing. Reports on loose caps.
412. Cartridges B.L., 6-inch howitzer, N.H.025. Propellant code letter.
413. Rocket, U, 5-inch. Painting of fin assembly.
414. Petard No.1. Marking for Picric Acid filling.
415. Cartridge Q.F., 37 mm. S.A.P. Shot, M.74 for guns M.3, M.5 and M.6.
416. Cartridge Q.F., 75 mm. S.A.P. Shot, M.72.
417. Cartridge Q.F., 37 mm. A.P. Shot, M.51. Lot 1 N.F. and Lot 2 N.F.
to be Practice Ammunition.
418. Plastic explosive. Instructions for inspection.
419. Naval Shell, B.L., H.E., 6-inch Mk.IX AQ in Land Service.
Explodering for fuzes of the No.45 type.
420. Cartridges. Unexpended Sections filled N.H. or F.N.H. powders.
421. Plugs fuze hole. Marking of non lead free brass plugs.
422. Rockets, U, tails propelling. Care and preservation.
423. Rocket, U, 3-inch. Temperature limitations.
424. Batch marking of ammunition assembled in Australia.
425. Rocket, U, Chemical, 5-inch. Marking to indicate unmachined
venturis.
426. Rocket, U, 3-inch. Traversed storage.
427. Fuzes base percussion No.500 and 501. Time of functioning.
428. Shell, H.E. for Coast Artillery. Explodering and fuzing.
429. Grenade, hand, No.75 and 75A.
430. Cte. Q.F. 6-pr. 7-cwt. complete round A.P. Shot.
431. Shell, Q.F., H.E., 3-inch 20-cwt. 3.7-inch and 4.5-inch guns.
Omission of smoke box.
432. Salvage of components of expended anti-aircraft devices.
433. Amendments.
434. Radio transmission and electrically operated ammunition.

ENEMY AMMUNITION.

434. German piercing shell Q.F., 7.5 cm., 5 cm. and 4.7 cm.
435. German 7.92/13 mm. A.P., tracer, lachrymatory cartridge.
436. Reports on sabotage devices.

411. SHELL POINTED OR PIERCING. REPORTS ON LOOSE CAPS.

When mention of loose caps is made in reports of inspection of shell fitted with ballistic caps it should be definitely stated whether it is the ballistic cap which is loose or the component to which the ballistic cap is fitted, i.e. a penetrative cap or a sheath.

412. CARTRIDGES, B.L. 6-INCH HOWITZER N.H. 025. PROPELLANT CODE LETTER.

Cartridges of U.S.A. manufacture containing propellant lots M.A.359 and M.A.364 have had the code letter "L", instead of "O", stencilled on the cartridge bag.

413. ROCKET U, 5-INCH. PAINTING OF FIN ASSEMBLY.

A number of tails propelling have been incorrectly painted in that the fin assemblies have been painted stone colour, the same as the body, instead of being left black. This difference in colouring has no significance. Details of this store are given in Item 324, Bulletin No.22.

414. PETARD NO.1. Marking for Picric Acid Filling.

Reference Item 340, Bulletin No.22.

When a picric acid bursting charge is used in the petard it is filled in the crystal form and not in the cast form (i.e. lyddite). The stencilling to indicate a bursting charge of this nature will be the letters "P.A." and not "LYD" as stated in Item 340.

An amendment to the Item is included in this Bulletin.

415. CARTRIDGE, Q.F. 37 mm. SHOT S.A.P. M.74 FOR GUNS M.3, M.5, & M.6.

The components of this fixed Q.F. round are as follows :-

Primer, percussion M.23A1 (See Item 224 and Fig.66, Bulletin No.18)
Cartridge case M.16 (See Item 224 & Fig.65, Bulletin No.18)
Propellant, approx. .44-lb. F.N.H. (See Item 224, Bulletin No.18).
Shot semi-A.P. M.74. This is a steel projectile the head of which is struck with a radius of 2.205 inches. The gilding metal driving band is secured by four rows of knurling and the tracer cavity and filling in the base are the same as those in the Shot A.P., M.51, described in Item 224.

Markings.

The shot is painted black without ring or tip markings and is stencilled in white "37G Shot Semi A.P. M.74 with Tracer"

The base of the cartridge case is stencilled by the silver nitrate process or black marking ink to indicate the ammunition lot number and the designation of the shot.

Weights and dimensions.

The weights and overall lengths are as follows :-

Complete round 13.01 inches, 3.34-lb.
Shot 4.84-inches, 1.92-lb.
Case 8.75-inches, .93-lb.

The diameters of the case are :-

Flange 2.19-inches, shoulder at 5.86-inches from flange
1.93-inches, neck at 7.14-inches from flange 1.43-inches.

416. CARTRIDGE Q.F. 75 MM. S.A.P. SHOT M.72.

This round is used with the following guns:- Mark I (M.1897), Converted Mark I (M.1917), M.1916, M.2, M.3 and T.6.

The complete round consists of the following components :-

Case	Primer	Propellant	Projectile
M.18.	M.31.	1.9-lb. F.N.H.	S...P. M.72.

Details of the cartridge case and primer, percussion, M.31 are given in Item 137, Bulletin No.13 and Item 250, Bulletin No.19, respectively.

Shot, S.A.P. M.72 is solid, apart from the tracer cavity which is formed in the base. The head is struck with a radius of 5 inches and the base streamlined at a slope of approximately 8 degrees 45 minutes. The filling and closing of the tracer cavity is the same as that in the A.P. Tracer Shot M.61 which is described in Item 250, Bulletin No.19.

Markings.

The ammunition lot number, followed by the fillers initials, also the designation of the round, "Shot, Semi-A.P., M.72", are stencilled on the base of the case.

The shot is painted black, without ring or tip markings, and is stencilled in white "75G Shot, Semi-A.P. M.72 with Tracer". The tracer lot number is stencilled below the driving band but is not visible when the round is assembled. The lot number, year of manufacture, manufacturers initials and the designation of the shot are stamped in the base.

Weights and Dimensions.

Length of projectile	9.3-inches.
Length of complete round	20.81-inches.
Weight of projectile	13.94-lb.
Weight of complete round	18.8-lb.

417. CARTRIDGE, Q.F. 37 MM. SHOT A.P., M.51, FOR ANTI-TANK GUN M.3.
LOT 1 N.F., AND LOT 2 N.F. TO BE PRACTICE AMMUNITION.

Reference Item 224, Bulletin No.18.

Cartridges assembled by National Fireworks in lots 1 and 2 are fitted with A.P. shot which are not up to the specification standard for perforation of face hardened plate. The place of assembly of these rounds is given on the ammunition data cards as N.F. and quantities comprising the lots concerned are, Lot 1 N.F. 500 rounds and Lot 2 N.F. 6100 rounds.

These shot would be suitable for use against homogeneous plate and at the time when they were supplied a special marking, consisting of two blue bands, was introduced to distinguish them from the normal blue painted "Target Practice" projectile so that in an extreme emergency they could be issued for operational purposes.

The ammunition in these lots is now to be regarded as normal practice ammunition. Boxes and rounds will be examined to verify that they are correctly marked. Where necessary, two blue bands will be painted on the shot and boxes will be marked in accordance with Fig.67, Bulletin No.18. Ammunition data cards should be amended regarding the nature of projectile where necessary.

The weight of the propellant charge in these lots is given as 7.1-ozs. on the ammunition data card. This varies considerably from the normal approximate weight of 8-ozs. 3 drams. given in Item 224, Bulletin No.18 but the expected M.V. (2600 f.s.), also given on the data cards, is the full charge M.V. There is no reduced charge for this equipment and in consequence the black line across the base of the case has, in some instances, been omitted.

418. PLASTIC EXPLOSIVE. INSTRUCTIONS FOR INSPECTION.

1. Wrappings should be unbroken. The outsides of the cartridge and the interior of the cases should be free from oily matter. The charge itself should be of a uniform yellow or buff colour.
2. Any charge when removed from its wrapping should be free from hard and brittle skin and should be capable of being moulded, broken and reunited by hand without crumbling. It should be noted that when a charge is first handled it may feel stiff, but that this stiffness should soon disappear under handling, the charge more or less rapidly working up into a plastic mass resembling luting Mk.IV. It is not possible to suggest comparison for plasticity with a material like putty or plasticene as these substances are too variable in consistency.
3. Deterioration in explosive properties is unlikely to occur during any reasonable period of storage, and as long as the present order to fire charges with a 1 oz. primer stands, periodic firing test will not be called for, at least for some time to come. If however with any particular purpose in view it is proposed to fire the material with a detonator only, a check firing should be made beforehand in order to ascertain that the proposed type of detonator will bring about full detonation of the material.
4. There is no satisfactory method of rectifying P.E. which has aged and has consequently lost its essential characteristic plasticity. Any attempt to rework "aged" P.E. by hand with a substance like mineral jelly can only result in serious loss of density of the P.E. with adverse affects on its explosive properties. NO SUCH ATTEMPT AT REWORKING OR REPLASTICISING WILL THEREFORE BE MADE. It can however be allocated to purposes other than those for which it was intended, if otherwise suitable. If necessary reference on this point can be made to the War Office (W.S.9).
5. Stocks of P.E. which have aged so as to become no longer plastic, and for which no alternative use can be found, should be reported to C.I.O.O. on A.F.G.815.

57/ammunition/3562 (W.S.9.)

**419. NAVAL SHELL, B.L., H.E. 6-INCH MARK IX A.Q. IN LAND SERVICE.
EXPLODERING FOR FUZES OF THE NO.45 TYPE.**

The exploder system for the No.44 fuze in these shell is to be converted to accommodate the longer fuzes of the No.45 type.

The operation, which will be carried out under the supervision of an I.O.O., consists of removing the upper exploder from shell which are stencilled "Use 44 fuze" and inserting two tracing cloth discs on top of the remaining lower exploder. The tracing cloth discs must be inserted with their glossy surfaces in contact.

Before inserting the No.45 type fuze or its corresponding plug, (Plug, fuze hole, special No.3 Mk.I) it must be verified that the depth of the fuze hole is such that the fuze, when screwed home, will compress the exploder. This will be verified by the use of the "Gauge, depth of fuze hole, filled H.E. Shell No.1" and, where adjustment is necessary, glazedboard discs of .8-inch diameter will be inserted in the bottom of the exploder cavity.

In connection with the insertion of fuses and plugs the instructions given in R.A.O.S. Part II, Pamphlet No.1, Paras. 131, 132, 137 and 152 should be followed.

After conversion, the stencilling on the shell regarding the fuze and the details of the exploders should be amended.

As the result of previous conversions the exploders may be found to be either Picric Powder or T.N.T. These are both considered suitable with detonating or igniferous fuses for anti-ship purposes.

420. CARTRIDGES. UNEXPENDED SECTIONS FILLED N.H. OR F.N.H. POWDERS.

Unexpended sections of howitzer or other cartridges of N.H. or F.N.H. powder will be salvaged and collected according to size. The propellant will be utilised when a sufficient quantity of the size to constitute a lot for blending is collected.

421. PLUGS FUZE HOLE. MARKING OF NON LEAD FREE BRASS PLUGS.

The use of non-lead free brass has been approved for the manufacture of plugs for use in shell filled other than Lyddite or Shellite, provided the plugs are clearly marked with the letters G.Y. for identification.

422. ROCKETS U. TAILS PROPELLING. CARE AND PRESERVATION.

Item 251, Bulletin No.19 and para.(i) of Item 327, Bulletin No.22 are hereby cancelled and superseded by the following :-

The R.D. cement seal fixing the closing disc in position at the end of the tail (see Fig.86 Bulletin No.19 and Fig.108, Bulletin No.22) is liable to be rendered ineffective by warping of the disc. This warping cracks the cement, allowing moisture to enter the tail, and results in irregular performance of the rocket.

The extent to which the tail may be effected in these circumstances will vary according to the time the sealing has been defective and the action to be taken by units will depend upon whether the defect is discovered when the tails are unpacked to be prepared for "Ready Use" or at the daily inspection of ammunition held prepared for "Ready Use".

When tails are removed from their packages to be assembled for "Ready Use" the inspection should include a careful examination of the closing discs. Tails found with defective sealing or warped discs will not be prepared for "Ready Use" but will be set aside and reported to the I.O.O.

Tails found with defective sealing or warped discs at the daily inspection of "Ready Use" ammunition will be repaired by the unit and then regarded as being serviceable. The repair will be made by the application of R.D. Cement No.1.

Tails found with defective sealing in packages which have been set aside for examination because of damage in transit will be repaired under the supervision of the I.O.O.

423. ROCKET, U. 3-INCH. TEMPERATURE LIMITATIONS.

Reference Item 364, Bulletin No.23. The high temperature limit for tails propelling containing cordite of the following B.S. lots has been reduced to 65°F.:-

Lots B.S.2012 to 2022
Lot B.S.2024
Lots B.S.2100 to 2108
Lots B.S.2111 to 2115
Lots B.S.2121 to 2125
Lots B.S.2131 to 2135

The existing marking of "80°F." on these tails and their packages will be obliterated by painting and a marking of 65°F. substituted.

424. BATCH MARKING OF AMMUNITION ASSEMBLED IN AUSTRALIA.

Batch numbers for fixed Q.F. and mortar ammunition assembled in Australia are now allocated by the Dominion Authorities concerned without application to C.I.A.

In order to avoid duplication of batches all ammunition assembled in Australia have the letters "AUST" added after the batch number on the package e.g. "B.100. AUST" or in the case of a sub batch, "B.100.AUST-A". No addition will be made to the marking on the rounds.

The following is a list of all ammunition assembled in Australia and issued without the addition of "AUST". The batch numbers of this ammunition may be duplications of C.I.A. batch numbers:-

<u>Ammunition</u>	<u>Batch Numbers.</u>
Bombs, M.L. H.E. 3-inch mortar.	B.1 to B.167
Bombs, M.L. Practice 3-inch mortar.	S.1 to S.4
Ctges. Q.F., 2-pr. Mk. IX and X guns, A.P. Shot.	E.1 to E.2
Ctges. Q.F., 2-pr. Mk. IX & X guns, Practice, flatheaded shot.	X.1 to X.3
Ctges., Q.F., 3-pr. 2-cwt. practice.	T.1 to T.3
Ctges., Q.F., 3-pr. sub-calibre.	T.1 to T.3
Ctges., Q.F., 6-pr. sub-calibre.	T.1 to T.4
Ctges., Q.F., 18-pr. H.E., S.L., full charge.	H.1 to H.229.
Ctges., Q.F., 18-pr. H.E., full charge.	B.1 to B.11
Ctges., Q.F., 18-pr. shrapnel, full charge.	A.1 to A.5.
Ctges., Q.F., 3-inch 20-cwt., H.E. full charge.	B.1 to B.48
Ctges., Q.F., 3-inch 20-cwt., shrapnel, full charge.	A.1 to A.4.
Ctges., Q.F., 3-inch 20-cwt., practice, full charge.	S.1 to S.12
Ctges., Q.F., 3-inch 20-cwt., practice, B.S. charge.	W.1 to W.8
Ctges., Q.F., 3.7-inch gun, H.E., full charge.	B.1 to B.23.

Batches will run consecutively from those listed, e.g. the next batch of 3-inch H.E. mortar ammunition after B.167 is B.168.AUST.

425. ROCKET, U, CHEMICAL, 5-INCH. MARKING TO INDICATE TAILS FITTED WITH UNMACHINED VENTURIS.

Reference Item 324, Bulletin No.22.

The letter "H" in black one inch stencilling on the outer tube near the fin assembly indicates that the bore cone of the venturi is not machined.

Rockets fitted with one of these tails have been found to give a more accurate performance and the marking has been introduced to facilitate sorting.

The marking is also stencilled on the ends and sides of the package.

426. ROCKET, U, 3-INCH. TRAVERSED STORAGE.

Reference Item 193, Bulletin No.17.

Some misconception seems to exist regarding the provision of traverses for buildings referred to in the para preceding that headed "Care and Preservation" on page 3. It is intended that these traverses should extend all round the building, ends and sides. If found to be more convenient the traverses may be constructed with both sides vertical. In such cases the traverse should be not less than 2 ft. 6 inches in thickness if the face nearest the ammunition is of brick or concrete. If this face is of a less resistant material the thickness of the traverse should be not less than 3 feet.

427. FUZES, BASE, PERCUSSION, NO.500 AND 501. TIME OF FUNCTIONING.

Reference Item 362, Bulletin No.23.

Although these fuzes have no delay fitment nor optional delay setting device the delay given ensures that the shell bursts after passing through the plate.

The delay actually attained is greater than that inherent in the graze action alone and a large part of it results from the method of filling.

428. SHELL H.E. FOR COAST ARTILLERY. EXPLODERING AND FUZING.

Reference Bulletin No.23, Item 351, Table 1, (Naval H.E. Shell in Land Service. Methods of Filling). The combination of an igniferous fuze and T.N.T. exploders referred to in the "Notes" column of the table may also be met with in H.E. shell filled Lyddite to Land Service designs and fitted with fuzes suitable for anti-ship purposes. Likewise the combination of a detonating fuze and Picric Powder exploders may also be met with. Information to this effect is given in the following publications :-

R.A.O.S. Part II, Pamphlet No.1, para.42(c).
Text Book of Ammunition 1936, page 205, Note (W)(iii).

429. GRENADE, HAND, NO.75 AND NO.75A.

Reference Item 373, Bulletin No.23 and Item 388, Bulletin No.24.

The explosive "Burrowite" will also be used as a filling with 4 exploders. When Military Ammonal and 4 exploders are used the efficiency of the grenade is only 80 per cent. as compared with the other fillings and grenades thus filled will be known as No.75A grenades. These will be identified by the letter "A" stencilled in half inch block lettering on the side of the grenade opposite to that carrying the striker plate.

Burrowite consists mainly of Barium Nitrate, T.N.T. and aluminium.

Detonators will not be assembled with their igniters in future when packed. Instead of the wooden tray referred to in Item 373 two tinned plate boxes are packed with the grenades. One box will contain 24 detonators and the other, 24 igniters. The dimensions of the boxes are 7.1 x 3.15 x 1.4 inches and each is provided with a wooden packing piece.

430. CARTRIDGE Q.F. 6-PR. 7-CWT. COMPLETE ROUND A.P. SHOT.

Reference Item 39, Bulletin No.5 (Details of Tank Ammunition). The details of the above round and packing are as follows :-

Ammunition.

Approx. weight	Approx. Length	Propellant	Primer	Explosive Quantity
Round 12-lb. 15-oz.	23.22 inches.	2-lb. 5-oz. 6-dr. N.H.033.	No.15, Mk.IIIQ.	1.2-lb.
Shot A.P. Mk.IIIQ. 6.28-lb.	6.81 inches.			

Package.

No. of Package.	Material and type.	Stowage dimensions.	Estimated Weight.	Contents
C.263	Steel box	27.6 x 8.5 x 8	Empty 13-lb. 14-oz. Filled 73-lb. 14-oz.	4 rounds, each in Container No.42.
C.264	Steel box	26 x 13.8 x 9.5	Empty 21-lb. Filled 111-lb.	6 rounds, each in Container No.42.

The tracer cavity in the shot (Fig.154) is filled to design No. 13074 which consists of two forward pressed portions of Composition S.R.261 and a pre-pressed pellet portion of S.R.261 with a priming of S.R.399, at the rear. The pellet is contained in a waxed paper tube and the rear face of each portion is in the form of a stepped cavity. The tracer cavity is closed by a cup shaped steel disc with a central hole. The hole is closed by external and internal paper discs. The time of trace is 3.5 seconds.

The shot is marked in the normal way and bears the design number of the method of filling, 13074.

Further dimensions.

Diameter of Shot 2.264 inches.

Diameter of driving band 2.31 inches.

Diameter of case flange 3.54 inches.

Length of case 17.4 inches.

Weight of complete round in Container No.42 15-lb.

431. SHELL, Q.F., H.E., 3-INCH 20-CWT., 3.7-INCH AND 4.5 GUNS.
OMISSION OF SMOKE BOX.

Approval has been given for the omission of smoke boxes from these shell. The consequent modifications to filling designs are as follows :-

3-inch. Design 8028A.

The depth of cavity is adjusted to 6.08 inches by the insertion of glazedboard discs and two "Y" exploders of T.N.T. are placed in the cavity instead of the smoke box.

3.7-inch and 4.5-inch. Design 8029A.

The depth of the cavity is reduced .3 inch by the insertion of glazedboard discs and two "Y" exploders of T.N.T. are placed in the cavity or, as an alternative, an "A" exploder bag containing 20.5 drams of T.N.T. and choked to a length of 3.6 inches may be used.

Shell filled to these designs may be identified by the letter "A" following the design number and by the absence of the green discs stencilled on shell which contain the smoke box of red phosphorus. The SMK BX marking on the base of the case is also omitted.

432. SALVAGE OF COMPONENTS OF EXPENDED ANTI AIRCRAFT DEVICES.

The components which may be found in some districts include the following :-

1. A cylindrical bomb approximately 4 inches long and $2\frac{1}{4}$ inches in diameter. The bomb is fitted with a circular ring at one end and bears the usual markings of an H.E. bomb.
2. Lengths of thin cable and spiral steel wire.
3. Parachutes of small diameter, i.e. approximately 6 feet and below.
4. Cylindrical canisters of tinned plate approximately 17 inches long and 3 inches in diameter.
5. Ballistic caps 3 inches in diameter and approximately 9 inches in length.
6. Steel tubes between 8 and 9 feet long and 3 inches in diameter.

The salvage of these components, excepting the bomb and the cylindrical canister if not empty, is the responsibility of the civil authorities. Bombs and canisters with contents are dealt with by bomb disposal units.

434. RADIO TRANSMISSION AND ELECTRICALLY OPERATED AMMUNITION.

Magazine Regulations, Part I, 1941, Para.49 provides for a safety distance between radio transmitters and storehouses containing ammunition of the electrically operated type, e.g. detonators, primers, Tails propelling, etc. It is emphasised that this para. refers purely to storehouses and not to ammunition on the move or at operational sites.

In view of the increased use, both of radio transmissions and the electrically operated types of ammunition, the paragraph in question has had to be reviewed and a series of experiments have been carried out to determine the precise effect of radio transmission on this ammunition.

It is definitely established that electrically operated ammunition can be functioned by radio transmission under certain conditions, these depending upon the power of the transmitter, the length of unscreened connecting wires and the distance between transmitter and ammunition.

Of these, the most important factor is the length of unscreened wire, i.e. wire not completely surrounded by metal. It has been established that when the connecting wires are completely screened, as in a vent electric tube or Tail, propelling, U, the possibility of the ammunition being functioned by radio can be practically ruled out. Hence all types of service ammunition in their service packages may be accepted as safe from this danger.

When the ammunition is removed from Service packages and placed in ready use or action positions, the situation is changed and the possibility of functioning may be considered as follows :-

Wireless Tubes and Primers used for gun ammunition can be accepted as safe.

Tails, propelling, U, in ready use shelters are also safe, but when placed in the projector, the firing leads may not be sufficiently screened to prevent a slightly increased risk. Projectors should, as a precaution, be sited at least 25 yards from a G.L. set and 150 yards from a High Power Radio transmitter, 1 k.w. or over.

Demolition lay-outs with the connecting wires under the ground are also safe and to a lesser degree, the same is true when the wires are on top of the ground. In both these cases, as in all cases of unprotected connecting wires, an effective safeguard is obtained by twisting the wires. This should invariably be done. Should aerial wires be employed for connecting to a detonator the danger from radio interference is very great, sufficiently so to justify their prohibition, unless they are twisted.

Whilst the above information is reassuring, it is still necessary to exercise prudence in regard to the juxtaposition of this type of ammunition in bulk and radio transmitters and the paragraph in question is therefore under consideration with a view to suitable modification. The loading and unloading of ships with this ammunition should only be carried out with the ship's wireless apparatus disconnected.

ENEMY AMMUNITION.

43. GERMAN PIERCING SHELL Q.F. 7.5 CM, 5 CM, AND 4.7 CM.
(Fig. 149)

(1) 7.5 cm. A.P.C. Shell.

The shell body is hardened throughout, the hardness diminishing from nose to base. The penetrative cap is attached to the shell by a low temperature soldering process. Both the shell (which is machined from rolled bar) and the penetrative cap are of 1 per cent chromium steel. The ballistic cap is attached to the penetrative cap by spot welding and varies in thickness from .037 inch at the nose to .057 inch at the base. The driving band is secured in the groove by longitudinal knurling and consists of soft iron under a copper exterior. An aluminium container for the bursting charge is set in the shell by means of a coal tar bitumen and a pad of the same material fills the reduced forward end of the cavity.

The bursting charge, weighing 83.3 grams (2-oz.15-dr.) consists of a 33.9 gram cast pellet of T.N.T. at the forward end, a 21.5 gram cast pellet of T.N.T. with a central perforation containing a 10.4 gram pressed pellet of P.E.T.N./Wax in the intermediate position and a 17.5 gram cast pellet of T.N.T. adjacent to the fuze. This base pellet and the P.E.T.N./Wax pellet are designed to accommodate the forward end of the fuze. The space between the filling and the fuze body is taken up by an aluminium washer with paper and cardboard washers between it and the filling and a cardboard washer behind it. The weight of the shell is approximately 15-lb.2-oz.

Fuze.

The base fuze, which includes a gaine fitment, is shown in Fig. 151. The steel inertia pellet, containing the igniferous detonator is held away from the needle in the safe position by five centrifugal segments. The segments are held in the safe position by the expanding spring ring. The steel adapter carrying the needle has four flash holes in its base which lead to the cavity formed in its interior. The cavity is closed at the front end by a brass plug which has a small central flash hole coinciding with a hole in the base of the gaine plug. The gaine consists of an aluminium plug containing a mixture of lead azide and lead styphnate at its perforated base end and P.E.T.N./Wax at its forward end. The forward end is closed by means of an aluminium cap and the gaine is attached to the steel adapter in the fuze body by means of the aluminium dome.

The composition of the initiator in the igniferous detonator is:-

Mercury fulminate	8.1	per cent.
Potassium Chlorate	59.7	" "
Antimony Sulphide	29.4	" "
Glass	2.8	" "

Details of the tracer which screws into the base of the fuze are not available.

Action.

Centrifugal force set up by the rotation of the projectile in flight causes the segments to rotate on their axes against the expanding spring ring and, one after another, their inner ends move clear of the inertia pellet. There is no creep spring. On impact the inertia pellet sets forward and impinges the detonator on the needle. The resultant flash passes through the small hole in the brass plug into the gaine. The combination of the adapter cavity and the small hole in the brass plug is apparently intended to act as a short delay by expansion of the flash within the cavity.

(2) 5 cm. A.P. Shell.

The shell is of composite construction, the hard ogival head being flash welded to the softer cylindrical body. The head is of 1 per cent. chromium steel, the body of chromium molybdenum steel and the driving band is wholly of soft iron.

The bursting charge of P.E.T.N./Wax is filled to a density of 1.5 and is designed to form a cavity at the base for the gaine fitted to the fuze. A cardboard washer takes up the space between the filling and the gaine detonator. The weight of the shell is approximately 4-lb. 9-oz. and its exterior, except for an unpainted band at the nose, is coloured black.

Fuze.

The base fuze and gaine are shown in Fig. 152. The aluminium inertia pellet, containing the igniferous detonator is held away from the needle in the safe position by a hard brass shear wire. The brass needle is flat to provide flash channels and is retained in the steel body of the fuze by a screwed aluminium plug. The plug has a conical recess on the underside and a small central flash hole which is closed by a paper disc at the front. A steel cap with a central hole is fitted over the disc at the front end of the fuze body to which it is dummoured.

Gaine.

The gaine is screwed into an aluminium cylindrical adapter which is a sliding fit over the front end of the fuze. A pressed paper washer is used between the underside of the adapter and the fuze body. The gaine consists of an aluminium plug containing a mixture of lead azide and lead styphnate at its perforated base end and P.E.T.N./Wax at its front end. The perforation at the base end is closed by a gauze disc and an aluminium washer. The front end is closed by a screwed cap of aluminium.

Details of the tracer which screws into the base of the fuze are not available.

Action.

On impact the inertia pellet sets forward severing the shear wire and impinging the detonator on the needle. The flash passing over the flat needle and through the small hole in the aluminium plug enters the gaine. It is probable that the controlling effect of the small hole in the plug and also the presence of the paper disc on the front of the plug provides a short delay.

(3) 4.7 cm. A.P. Shell.

This is a normal armour piercing shell with an H.E. capacity of 1.6%. The filling consists of a 6.6 dram bursting charge of cast T.N.T. with a 5.3 dram intermediary of pressed T.N.T. The intermediary pellet is wrapped in transparent paper and has a cavity to receive the gaine portion of the fuze. A cardboard disc in the cavity and a washer in rear of the pellet provide seatings for the fuze and presumably allow for tolerances in the length of the filling and the fuze.

Details of the fuze and tracer are not yet available.

Weights.

Empty shell 1283.25 grams. (2-lb. 13-oz. 5-dr.)
Cast T.N.T. 11.7 grams (6.6 dr.)
Pressed T.N.T. 9.35 grams (5.3 dr.)

433. GERMAN 7.92/13 M.M., A.P., TRACER, LACHRYMATORY CARTRIDGE.
(Fig. 150)

The round consists of a necked brass case fitted with a black tipped bullet. The cap annulus is varnished red. According to normal German identification, these marks indicate an A.P.T. round.

The case resembles a 13 m.m. one necked down to 7.92 m.m. and has an unusually deep extractor groove. The head of the case is very thick and an interesting feature is the thickening of the wall of the "small cone" as the diameter is reduced towards the neck. This may be incidental to the coning but will help to withstand the action of the gases at this restriction. The cap is secured by three stabs.

The propellant charge consists of 200 grains of powder, apparently graphited N.C.T.

The bullet consists of a steel envelope coated on both sides with gilding metal and containing a tungsten carbide core in a lead sleeve and a tracer cup. A cylindrical cavity in the base of the core contains a .4 grain lachrymatory pellet. The tracer consists of a steel cup coated with gilding metal and containing a composition which produces a white trace which might be expected to last about 700 yards allowing for the very high velocity this bullet will probably have. The base of the bullet is sealed by the turnover of the envelope on to a pink celluloid disc supported by a brass washer.

The mouth of the case is coned into a flat fronted cannelure on the bullet.

Weights

Round.	1315.4	grains.
Case and cap.	889.7	"
Bullet.	225.7	"
Propellant charge.	200	"

433. AMENDMENTS:

Bulletin No. 19, Item 251:-
Delete the Item and substitute "See Item 422,
Bulletin No. 25."

Bulletin No. 20, Item 296, examples of present and new nomenclatures:-
Delete the third example:
(Cordite R.D.N./A.Q.M.T. 7 web 048 is not used in
Land Service).

Bulletin No. 22, Item 327:-
Delete para. (i) and substitute "See Item 422,
Bulletin No. 25".
Item 340, page 15, line 3:-
Delete "LYD" and substitute "P.A."

Bulletin No. 23, Item 362:-
Delete from "These" in line 12 to "system" in
line 13 and substitute "See Item 427 Bulletin No. 25"

Item 376, line 10 :-
Delete "steel" and substitute "tungsten carbide".

FIG. 149.
GERMAN PIERCING SHELL.

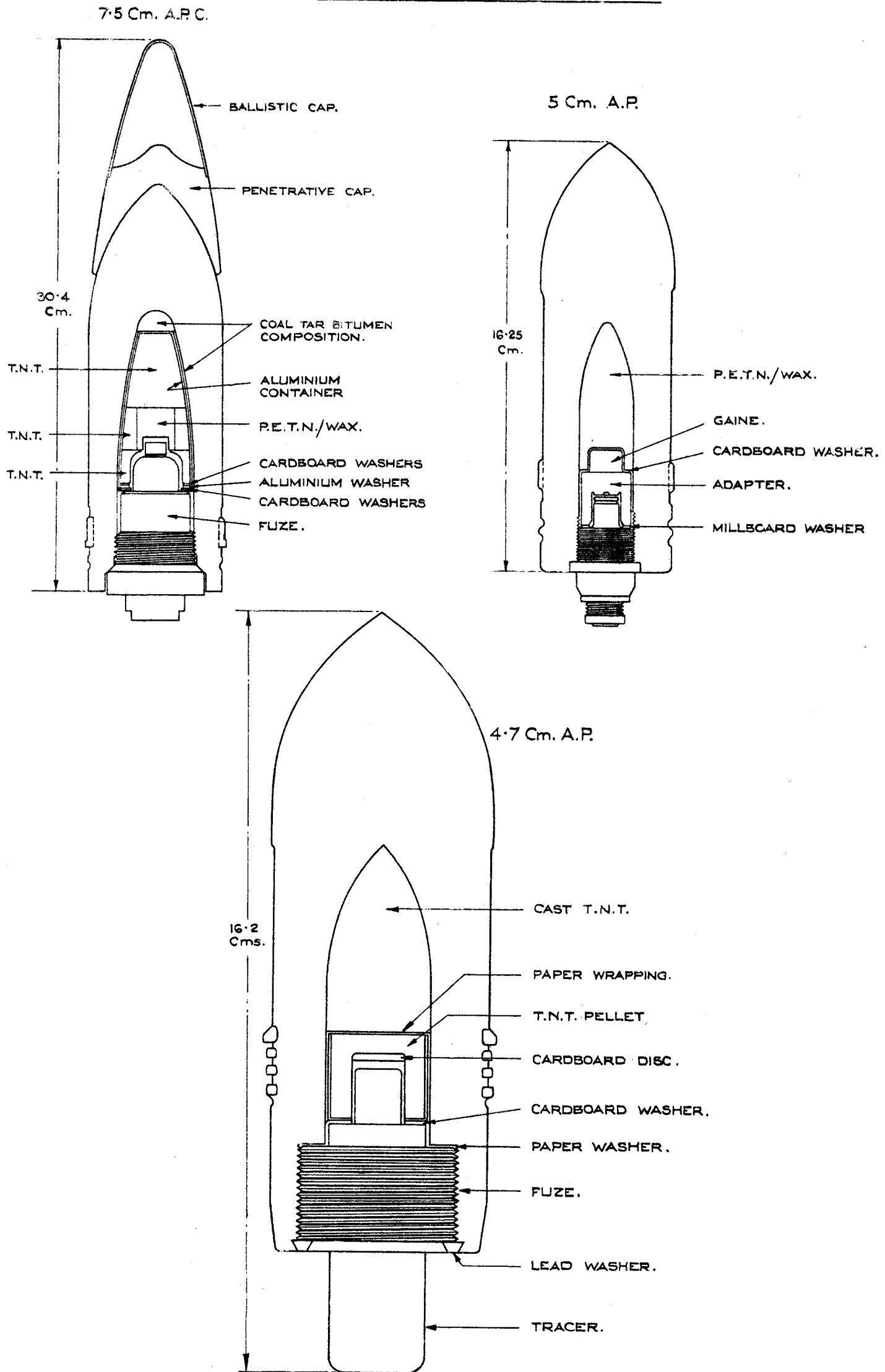


FIG. 151.

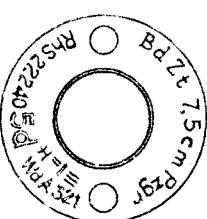


FIG. 150.

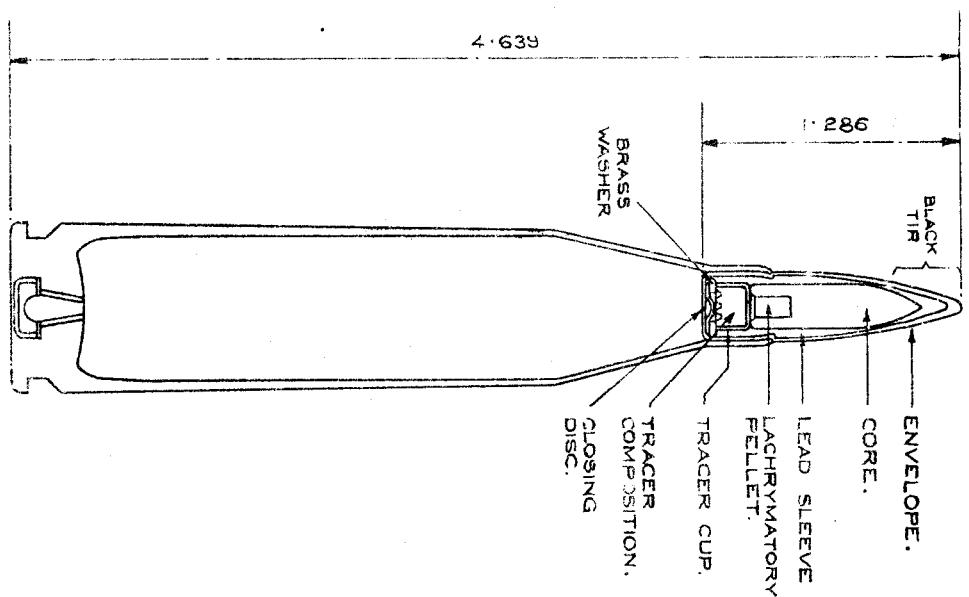
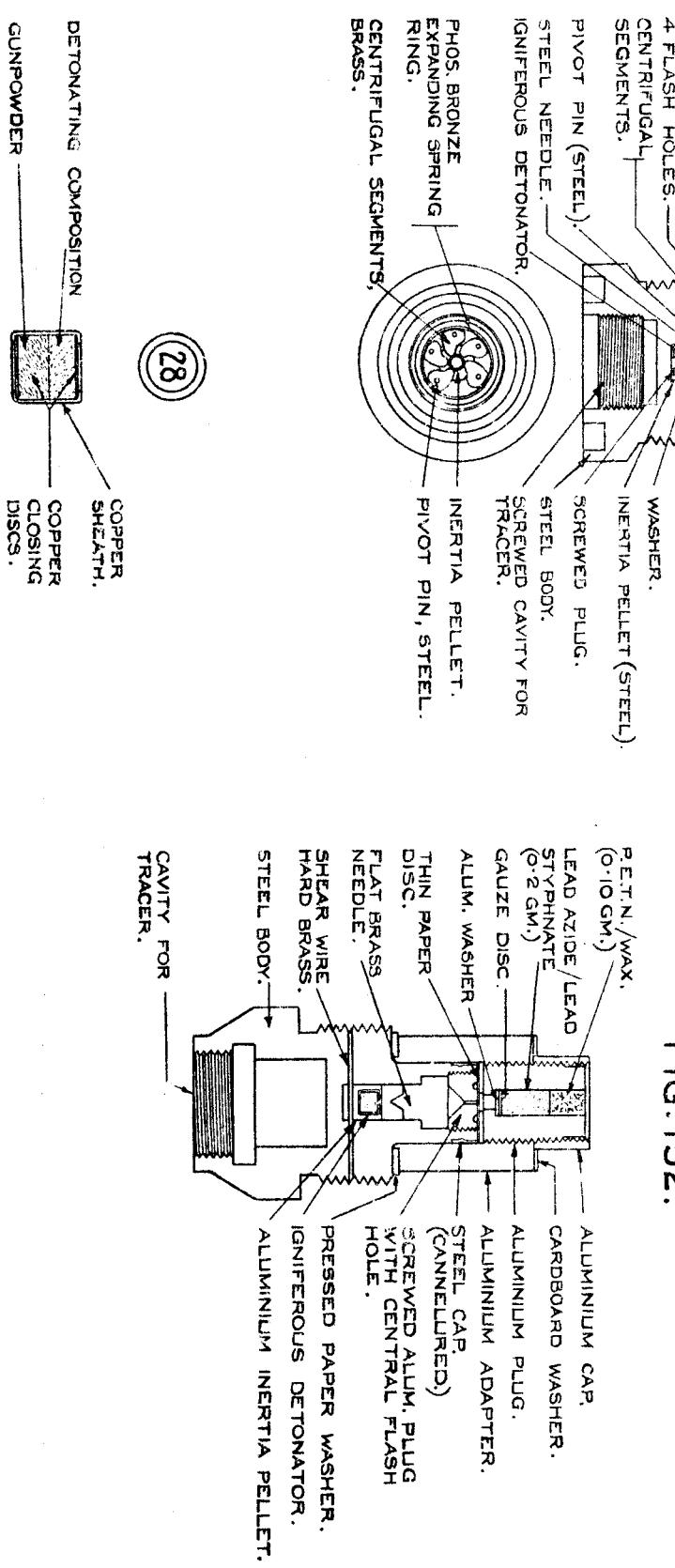


FIG. 152.



GERMAN AMMUNITION.

FIG. 154.
SHOT Q.F., 6 PR. 7 CWT. A.P. MK. III T.

